

MIRAGE



M-400 MULTI-ZONE
DIGITAL AMPLIFIER

AUTONOMIC

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this device near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Ensure that the ventilation is not impeded by covering the ventilation openings with items such as newspapers, table cloths, curtains, etc.
9. Do not install near any heat source such as radiators, heat registers, stoves or other devices (including amplifiers) that produce heat.
10. Use the device only in moderate climates (not in tropical climates).
11. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
12. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the device.
13. Only use the attachments / accessories specified by the manufacturer.
14. If you install the device in a built-in installation, such as a bookcase or rack, ensure that there is adequate ventilation. Leave 20cm (8") of free space at the top and sides and 10cm (4") at the rear. The rear edge of the shelf or board above the device should be set 10cm (4") away from the rear panel or wall, creating a flue-like gap for warm air to escape. Good airflow is necessary to help ensure proper operation. Not only should you provide enough free space around the device, but also ensure that air can flow freely and escape from the device's surroundings. Failure to do so may cause thermal shutdown of the device, and reduced life expectancy.
15. Unplug this device during lightning storms or when unused for long periods of time.
16. Never expose the device to moisture.
17. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device. The device has been exposed to rain or moisture, does not operate normally, or has been dropped.
18. Damage requiring service. Unplug the device from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power supply cord or plug is damaged.
 - b. If liquid has been spilled, or objects have fallen into the device.
 - c. If the device has been exposed to rain or water.
 - d. If the device does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the device to its normal operation.
 - e. If the device has been dropped or damaged in any way.
 - f. When the device exhibits a distinct change in performance this indicates a need for a service.
19. Object and Liquid Entry.

Never push objects of any kind into the device through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. The device should not be exposed to dripping or splashing and no objects filled with liquids, such as vases, should be placed on the device. Don't put candles or other burning objects on top of this device.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



WARNING
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS
RISQUE DE CHOC ELECTRIQUE
NE PAS OUVRIR



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

PRECAUTIONS

1. AC Fuse

The AC fuse inside the device is not user-serviceable. If you cannot turn on the device, contact the dealer from whom you purchased this device.

2. Care

Occasionally you should dust the device all over with a soft cloth. For stubborn stains, use a soft cloth dampened with a weak solution of mild detergent and water. Dry the device immediately afterwards with a clean cloth. Don't use abrasive cloths, thinners, alcohol, or other chemical solvents, because they may damage the finish or remove the panel lettering.

3. Power

WARNING

BEFORE PLUGGING IN THE DEVICE FOR THE FIRST TIME, READ THE FOLLOWING SECTION CAREFULLY.

AC outlet voltages vary from country to country. Make sure that the voltage in your area meets the voltage requirements printed on the device's rear panel. (e.g. AC 90V – 240V 50/60HZ) The power cord is used to disconnect this device from the AC power source. Make sure that the plug is readily operable (easily accessible) at all times. If you do not intend to use the device for an extended period, remove the power cord from the AC outlet.

4. Ground

The device is defined as Class1 in EN60065 (low voltage directive) and MUST BE GROUNDED. Connect only to an outlet with protective ground, and only use the power cord supplied.

Finland: "Laite on liitettävä suojamaadoituskoskettimillä varustettun pistorasiaan"

Norway: "Apparatet må tilkoples jordet stikkontakt"

Sweden: "Apparaten skall anslutas till jordat uttag"

5. Never Touch This Device With Wet Hands

Never handle this device or its power cord while your hands are wet or damp. If water or any other liquid gets inside this device, have it checked by your Autonomic dealer.

6. Handling Notes

- If you need to transport this device, use the original packaging to pack it how it was when you bought it.
- Do not leave rubber or plastic items on this device for a long time as they may leave marks on the case.
- This device's top and rear panels may get warm after prolonged use. This is normal.
- If you do not use this device for a long time, it may not work properly the next time you turn it on, so be sure to use it occasionally.

7. Speaker Shorts

Under no circumstances should the speaker output terminals of the device be short circuited, grounded or connected to another output.

8. Direct Sun light

Avoid installing the device in positions where the front panel is exposed to direct sunlight – may cause control to become sluggish.

9. Controller Connection

Never connect more than four keypads. The supply is internally fused (self resetting) and may open circuit. Never connect the unit's 12VDC terminal ('Bus Run' port) to an external power supply

DECLARATION OF CONFORMITY

We declare under our sole responsibility that this product, to which this declaration relates, is in conformity with the following standards: EN60065, EN55013, EN55020, EN61000-3-2 and EN61000-3-3. Following the provisions of Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC, the EC regulation 1275/2008 and its framework Directive 2009/125/EC for Energy-related Products (ErP).

A NOTE ABOUT RECYCLING:

This product's packaging materials are recyclable and can be reused. Please dispose of any materials in accordance with the local recycling regulations.



When discarding the device, comply with local rules or regulations. Batteries should never be thrown away or incinerated but disposed of in accordance with the local regulations concerning battery disposal.

This product and the supplied accessories constitute the applicable product according to the WEEE directive.

FOR U.S. MODELS

FCC information for User.

CAUTION:

The user changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- » Reorient or relocate the receiving antenna.
- » Increase the separation between the equipment and receiver.
- » Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- » Consult the dealer or an experienced radio/TV technician for help.

SUPPLIED ACCESSORIES

Make sure you have the following accessories:

- » **IEC60320-1 Coupler (C-14 Male Plug)**
- » **Rack Mount Ears**

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A digital copy of this manual can be found at http://www.autonomic-controls.com/support_documentation.php

FEATURES

Thank you for purchasing an M-400 Mirage Multi-Zone Amplifier.

Please read this manual thoroughly before making connections and plugging in the device.

Following the instructions in this manual will enable you to obtain optimum performance and listening enjoyment from your new Multi-Zone Amplifier. Please retain this manual for future reference.

Multi-Zone, Multi-Source Switching

The M-400 amplifier has four separate amplifiers providing 4 zones of independent yet integrated control.

There are 6 input sources comprising the following:

- » Sources 1 – 4 are either Analog Stereo, or Coax Digital Audio (PCM).
- » Sources 5 & 6 are either Coax (PCM) or Optical Digital Audio (TOSLINK)

Amplifier Power, Protection, and Clipping Indicators

50 Watts RMS per channel into 8 ohm loads. Capable of driving into 4 ohm loads. The amplifiers are protected against output shorts, and have algorithms that prevent hard clipping when the zone amplifiers are overdriven.

Thermal Control

There are two progressive levels of thermal control:

- » The amplifier volume is reduced 20dB.
- » The amplifiers are shutdown until the temperature reduces below the first level.

Care should be taken to ensure adequate ventilation – see “Important safety instructions” on page 2

Real Time Clock

The M-400 amplifier is equipped with a real time clock. The clock automatically compensates for daylight saving time if configured to do so. The clock continues to operate typically > 48 hours without power (more than enough to keep the time current during lengthy power outages).

IR Emitter Ports

There are 8 Buffered IR emitter Ports.

Ports 1 – 6 have IR routing, and are intended to control specific input source components. Two IR ports “SUM IR1-IR6” are the sum of all IR sources and control the “All” zone source components.

Ethernet, RS232, USB and IR Control

The M-400 amplifier may be controlled and monitored via the rear Panel USB, RS232 serial interface or Ethernet. In multi-amplifier installations where the amplifiers are interconnected using an expansion bus cable, only one Ethernet or RS232 connection is required to control the stack of amplifiers. An M-400 amplifier may receive IR directly from the front panel receiver. There are zone specific IR commands and also a set of global IR commands.

The commands are:

- » ON
- » OFF
- » Standby (toggling)
- » Mute
- » Volume Up
- » Volume Down
- » Source Selects
- » Discrete Audio Source Selects
- » On with Source Specific commands

Expansion Bus

Data & IR are interconnected via the expansion bus.

One amplifier is connected to another using a standard RJ45 patch cable. Connections are made between amplifiers using either of the two RJ45 expansion bus sockets.

Discrete Audio Selection

Audio selection may be independent. There are RS232 and IR Discrete control commands available.

Zone Linking

A zone may be programmed to link multiple zones. Zone linking ties the source selection together. It may also tie the volume and standby. This is useful for closely coupled audio areas where it is advantageous to have different volume control but the same source, or the same volume with separate standby control. Zone linking is setup via the web config.

96 Zones

There are 96 zones of possible control. On an M-400 amplifier each zone must be different, however in a multiple amplifier stack, same zone amplifiers are possible (they simply mimic every parameter).

Power Failure Restoration

After an AC power outage the M-400 amplifier restores its settings to the pre-interrupted state. All internal settings are stored in non-volatile memory, except the clock that runs for at least 48 hours on stored power.

Firmware Upgradable

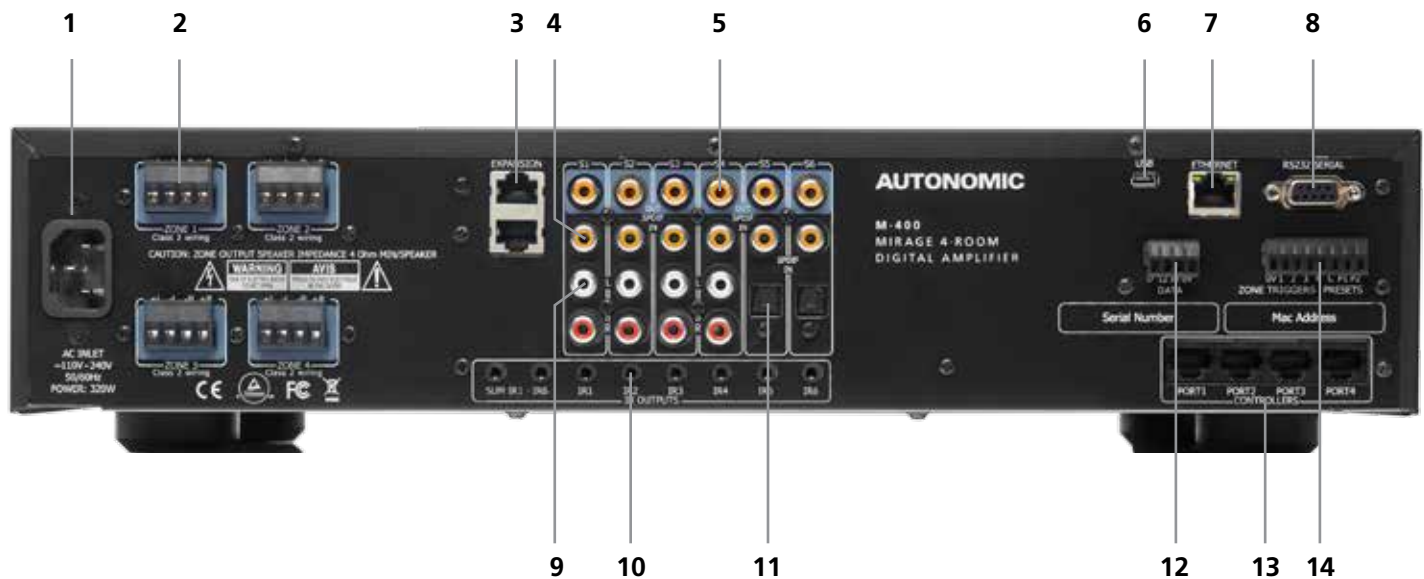
The M-400 amplifier may be updated with the latest operational firmware. See www.Autonomic-Controls.com for support.

FRONT PANEL GUIDE



1. **Front Panel**
Solid Aluminium front Panel.
2. **Infra-Red Receiver**
Receiver for front panel IR control (Used only for amplifier control, not IR pass through). No IR Remote supplied, however an IRC profile is located at www.Autonomic-Controls.com/Support/
3. **Power Indicator**
The power indicator glows blue whenever AC power is applied.
4. **Chassis Feet**
Set high enough to provide unrestricted air-flow through the chassis for convection cooling.
5. **Rack Mount Ears (Optional)**
Rack mount ears not depicted.

REAR PANEL GUIDE



1. **AC Inlet**
IEC socket
2. **Speaker Terminals**
Plug in terminal clamp connectors accept 1.5mm² speaker wires.
3. **Expansion Bus**
RJ45 patch cable connects between expansion bus ports of amplifiers in a stack.
4. **Coax Digital Input Terminals**
Coax digital (SPDIF) inputs.
5. **Coax Digital Source Output Terminals**
Coax digital outputs for expansion to further amplifier zones.
6. **USB for Programming**
USB mini B socket for programming and firmware updates.
7. **Ethernet Port**
This port is used for control, monitoring and data access.
8. **RS232 Communication Port**
The port is used for setup, control or monitoring. A straight through cable must be used when connecting to a PC or control system.
9. **Analog Input Terminals**
Analog Audio L/R inputs
10. **IR Emitter Ports**
3.5mm mono jacks. IR9 & IR10 ports output the combined IR1 – IR6 infra-red strings. Ports are not usable but are future ready for IR routing.
11. **Optical Digital Inputs**
Optical (TOSLINK) digital inputs.
12. **Bus Run Controller Interface**
For future use
13. **Controller Interface**
For connection to keypads and IR receivers. 4 controller interface ports - RJ45 sockets
14. **Zone Triggers**

TYPICAL SYSTEM CONFIGURATION

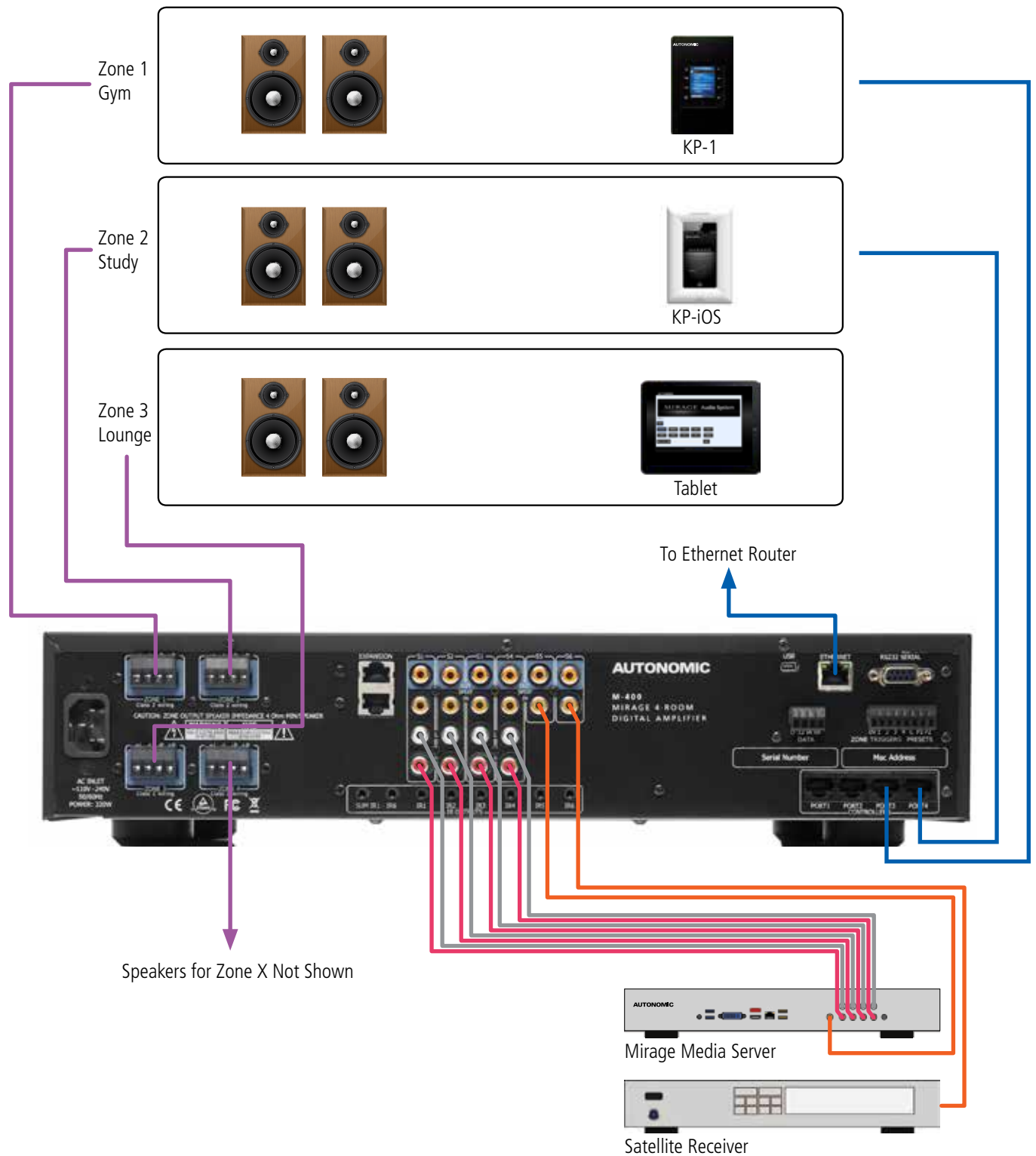


FIG 1.

TYPICAL SYSTEM CONFIGURATION – CONTINUED

Fig 1 depicts a typical configuration where the M-400 amplifier is providing audio into three of the possible four listening zones. Only three of the zones are depicted.

Each zone consists of a room with a pair of speakers and a suitable controller. Each zone may be listening on any of the connected sources:

- » Mirage Media Server
- » Satellite Receiver

Controllers

Each zone has a specific control requirement.
Choose controllers that best suit the application.

Zone 1 – The Gym: Speakers and KP-1 Keypad
Zone 2 – The Study: Speakers and KP-iOS Keypad
Zone 3 – The Lounge: Speakers and Tablet

- » The KP-iOS Keypad may be plugged into any of the four controller ports.
- » Source control IR emitters are plugged into the IR ports. There are eight IR ports: IR1 - IR6, and Sum IR1 - IR6.
- » IR 1 – 6 route source specific IR signals from connected controllers, while Sum IR1 - IR6 output the common IR or the sum of all received IR signals.
- » These ports may be used for source equipment that is common to all zones.

When controlling a stand alone M-400 using an iPad or other web tablet, the M-400 must be connected to a wi-fi enabled ethernet router and the web tablet browser must be directed to the M-400's IP Address. The M-400's web application also provides source control functionality.

Speakers

Speakers in each zone are connected to the amplifier by "Home Run" speaker cables.

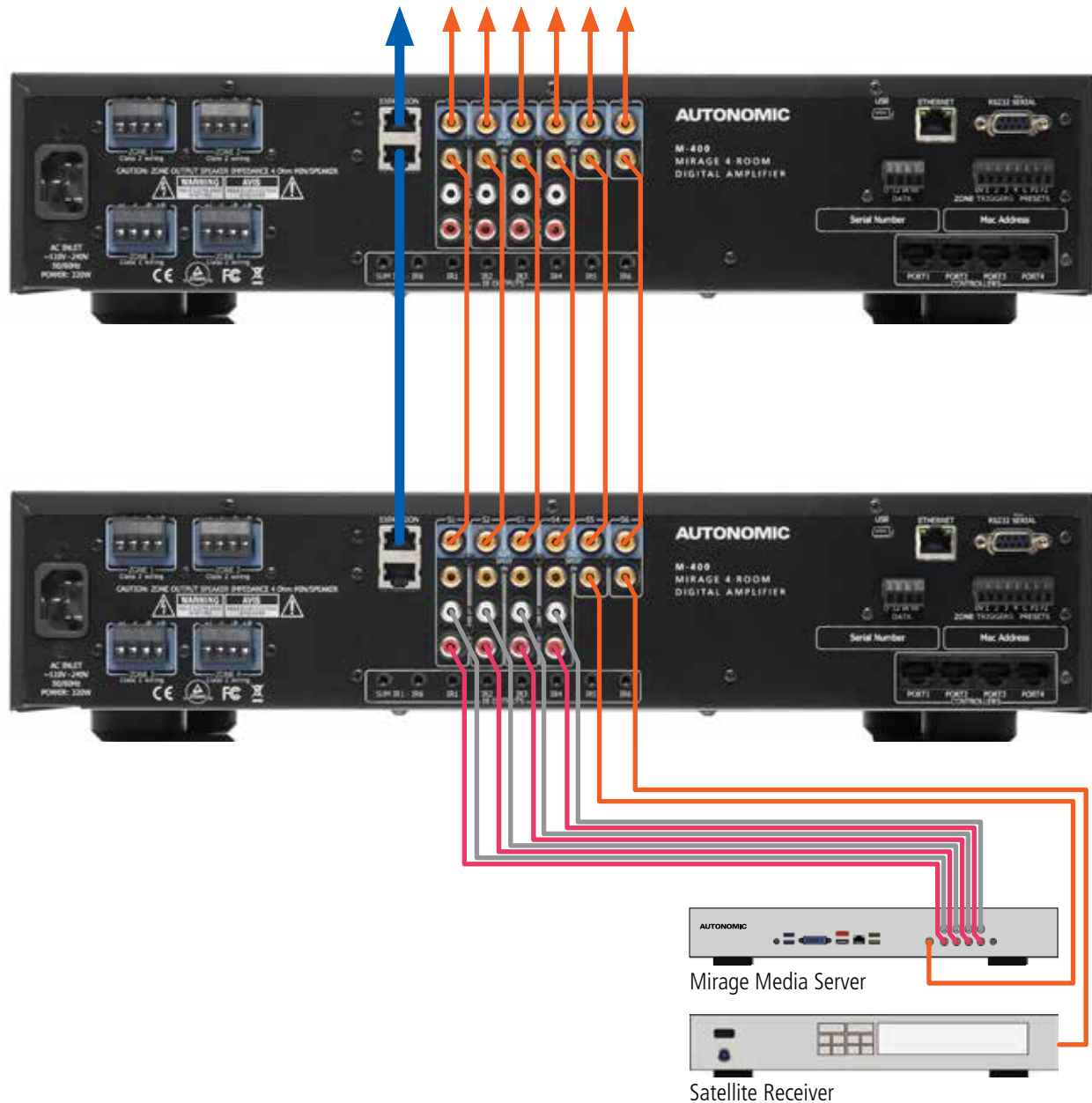
Source Equipment

The M-400 amplifier has four stereo RCA audio inputs for connecting to source equipment. These input channels feature coax digital inputs. If a signal is present on the digital input, it takes precedence over the analog input. There are two additional Digital only input channels featuring both coax and Optical inputs. Any source can be listened to in any zone, simultaneously.

All four zones may select the same source, in such circumstances there is a possibility that all six zones may be trying to control that source (not always desirable) so a system should be well planned and where appropriate additional source equipment installed.

Mirage Media Server

When pairing your M-400 amplifier with a Mirage Media Server, be sure to use the Mirage Media Server's web configuration Sources page and follow the pairing process there. This will ensure full control via the Mirage iOS and Android applications.



In large installations where multiple M-400 amplifiers are required, the expansion bus may be used to convey inter-amplifier control, and common IR control.

The source equipment audio inputs must be plugged into the first amplifier where they are buffered and sent to the next amplifier in the stack. The maximum recommended expansion is 24 units.

Fig 2 shows inter-connected amplifiers using an RJ45 expansion bus lead, and RCA leads for the source digital coax signals. Amplifier control using ethernet, RS232 or USB may be connected to any one of the M-400's in the stack.

CONTROLLER WIRING

The M-400 is packed with control options:

- » **USB:**
Intended for initial installation Programming or firmware update. Not intended for permanent connection to a PC or other control system.
- » **ETHERNET:**
100BaseT connection to a home network router or switch.
- » **RS232 Serial:**
Electrically isolated prevents hum in analog input circuits.
- » **CONTROLLERS:**
Conveys +12VDC, IR and data between the M-400 and KP-1 keypad controllers, connected using CAT5 cables.
- » **BUS RUN:**
For future use.
- » **TRIGGERS:**
+12VDC 100mA trigger output when a zone is on.
- » **EXPANSION BUS:**
Simple patch cable interconnection for Autonomic Amplifiers that conveys control and data between Amplifiers in a stack. (Fig. 4)



FIG 3.



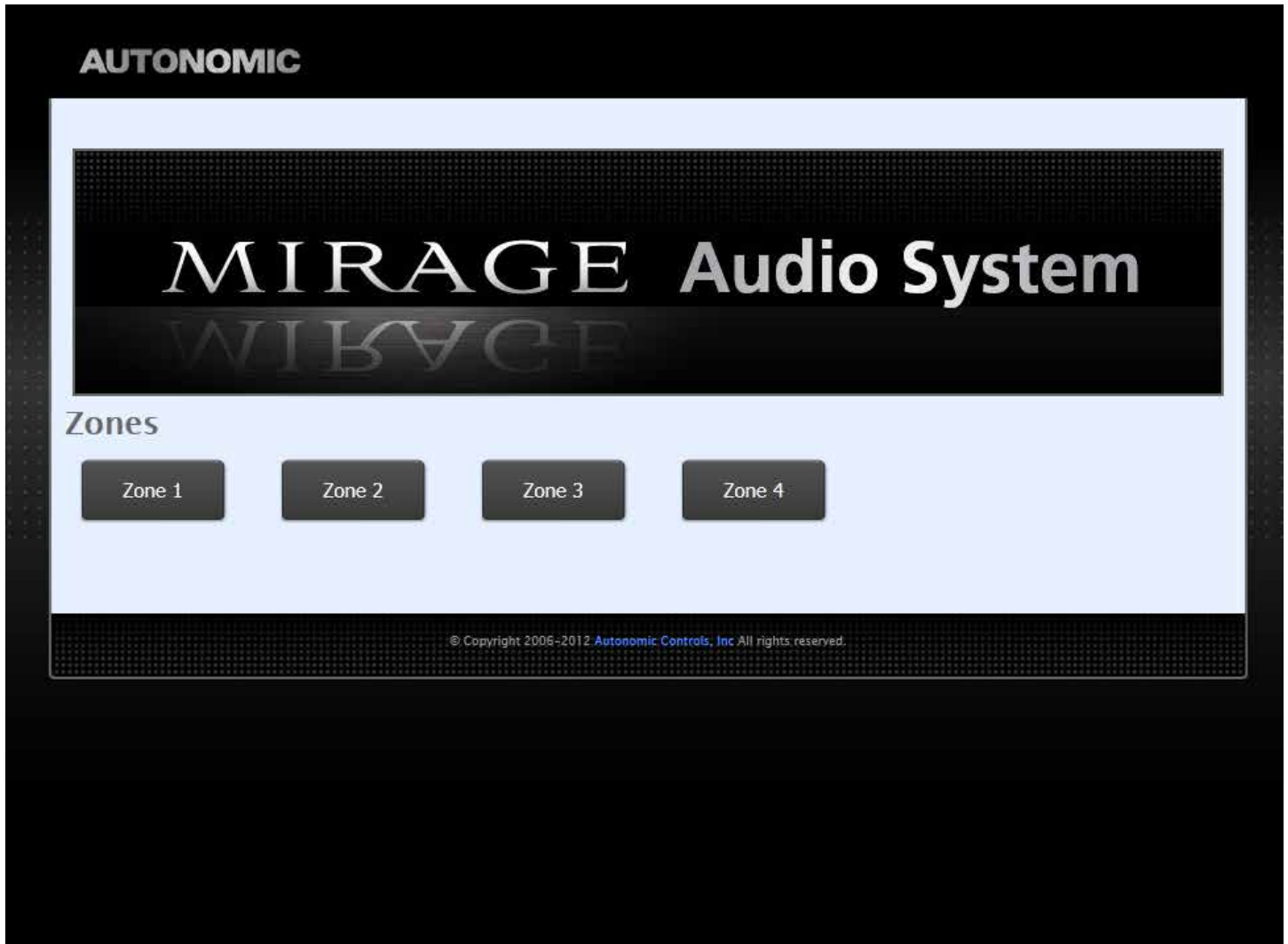
FIG 4.

WEB APPLICATION

The M-400 Amplifier has a web application which may be used for control and configuration of the amplifier and source functions.

Zone Selection Page (Home Page)

The Zone Selection page provides access to the Amplifier Zones. To access the web application, simply navigate to **http://ampIP/**. For example, <http://192.168.1.54/>. Selecting a Zone will highlight the button as shown in the picture below and will open its control page.

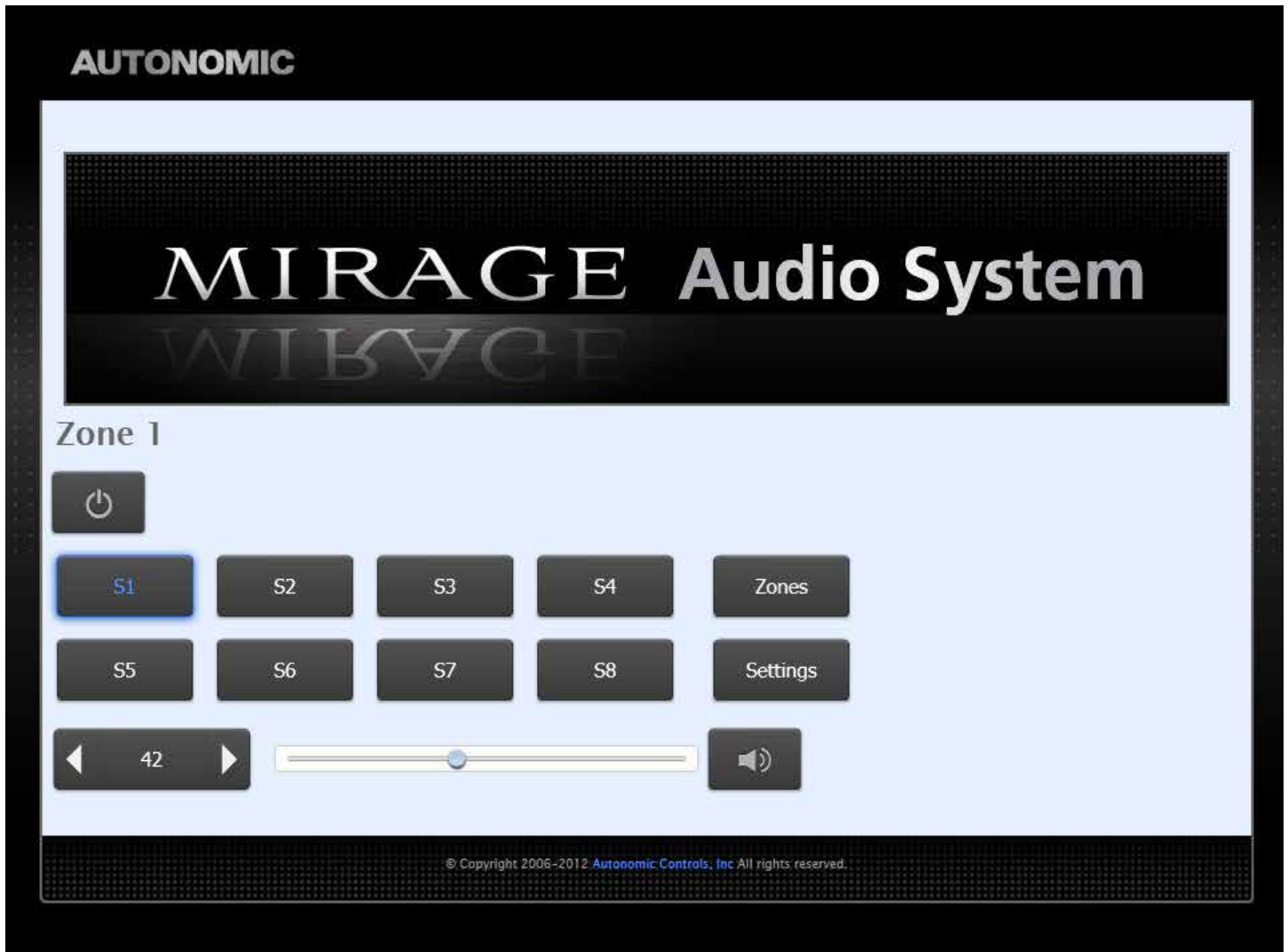


Zone Source Selection Page

The Zone Source Selection page provides status & control of:

- » Standby
- » Volume: Slider or Up/Down button with readout.
- » Source Selection: S1 – S6
- » Mute

If the button displays a blue glow, it indicates selection or ON status. Because of web browser limitations, slider setting changes are made using a positional touch on the slider. The "Zones" button is the Home page return. Selecting the "Settings" button will open the Settings page.



Zone Settings Page

The Zone Settings page provides status & control of:

- » Bass: Slider or Up/Down button
- » Treble: Slider or Up/Down button
- » Loudness
- » Balance: Slider or Left / Right button
- » Maximum Volume Limit: Slider or Up/Down button

The Back Arrow button returns to the Zone Control page.



Amp Settings Page

The M-400 amplifier has a settings page which may be used to change the following:

- » Amp network name
- » Amp IP settings, Including static IP
- » Time Settings

The Amplifier Settings page provides access to the device information and Date & Time. The configuration web interface can be found at, **http://<amp-ip>/config/** where <amp-ip> is the IP address of the amp. For example, <http://192.168.1.54/config/machine.html>.

The screenshot shows the 'Amplifier Settings' page of the AUTONOMIC MIRAGE Audio System. The page has a dark header with the 'AUTONOMIC' logo and three tabs: 'Amplifier Settings', 'Source Settings', and 'Zone Settings'. The 'Amplifier Settings' tab is active. Below the header is a large banner with 'MIRAGE Audio System' in a stylized font. The main content area is titled 'Amplifier Settings' and contains three sections: 'Device Information', 'Wired Ethernet', and 'Date and Time'. Each section has a table of settings and a 'Save Changes' button. The 'Device Information' section shows details like Amp Model (M800), Amp ID (6), Amp Firmware Version (1.0 beta 4), Amp Temperature (29°C), and MAC Address (00:50:C2:A8:A2:36). The 'Wired Ethernet' section shows the Amp Network Name (M800-6) and Connection (Automatic Configuration (DHCP)). The 'Date and Time' section shows the Date (Wednesday, October 10, 2012 6:49:40 PM), Observe DST (checked), and NTP Server (north-america.pool.ntp.org). The footer contains copyright information: © Copyright 2006-2012 Autonomic Controls, Inc. All rights reserved.

Device Information	
Amp Model	M800
Amp ID	6
Amp Firmware Version	1.0 beta 4
Amp Temperature	29°C (peak 30°C)
MAC Address	00:50:C2:A8:A2:36

Wired Ethernet – 192.168.1.228	
Amp Network Name	M800-6
Connection:	Automatic Configuration (DHCP)

Date and Time	
Date	Wednesday, October 10, 2012 6:49:40 PM
Observe DST	<input checked="" type="checkbox"/>
NTP Server	north-america.pool.ntp.org

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Amplifier Source Settings

The Amplifier Source Settings page allows you to rename the audio sources on the amplifier as they appear on any keypads you may have.

AUTONOMIC

Amplifier Settings

Source Settings

Zone Settings

MIRAGE

Audio System

Source Settings

Sources

Physical Source	Source Name [click name to edit]	
Source 1	MMS-5A Main	<div>Save</div> OR <div>Cancel</div>
Source 2	S2	
Source 3	S3	
Source 4	S4	
Source 5	S5	
Source 6	S6	
Source 7	S7	
Source 8	S8	

Save Changes

Undo Changes

Amp Sources

This allows you to rename the audio sources on the amplifier as they appear on any keypads you may have. Source names have a maximum length of 15 characters.

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Amplifier Zone Settings

The Amplifier Zone Settings page allows you to rename the zones as they appear on any keypads for any amplifiers you may have linked. Physical zones will appear grouped with the Amplifier they belong to, with their logical zones configurable. If you are linking multiple Amplifiers in a chain, it is only required to connect the first amp in the chain to ethernet. It is recommended that you connect only one Amplifier of a chain to ethernet.

Zone Groups allows control of multiple zones at once, as well as linking of volume and/or power. To add a group click Add Group. In the pop up box you can select from a list of zones. You can also configure whether volume and power are linked. When finished click Save. To edit a Zone Group, click on the wrench.

AUTONOMIC

Amplifier Settings

Source Settings

Zone Settings

MIRAGE Audio System

Zone Settings

Zones (00:50:C2:A8:A2:39)

Physical Zone	Logical Zone	Zone Name [click name to edit]
Zone 1	1	Zone 1
Zone 2	2	Zone 2
Zone 3	3	Zone 3
Zone 4	4	Zone 4
Zone 5	5	Zone 5
Zone 6	6	Zone 6
Zone 7	7	Zone 7
Zone 8	8	Zone 8

Save Changes

Undo Changes

Zones (00:50:C2:A8:A2:33)

Physical Zone	Logical Zone	Zone Name [click name to edit]
Zone 1	9	Zone 9
Zone 2	10	Zone 10
Zone 3	11	Zone 11
Zone 4	12	Zone 12

Zone Groups

Group ID	Grouped Zones	Configured Settings	Options
1	2,3		
2	4,5		
3	6,8		
4	10,11		

Add Group

Zone Settings

Rename the zones as they appear on any keypads for any amplifiers you may have linked. Physical zones will appear grouped in the amp they belong to, with their logical zones configurable. If you are linking multiple amps in a chain, it is only required to connect the first amp in the chain to ethernet. Amps and their zones will be displayed in the order in which they are discovered. Zone names have a maximum length of 15 characters.

Zone Groups

Configure Zone Groups to link zones by volume, power, or both. There is no limit to the number of zones in a group, but a zone may only be a member of a single group.

Group 1 Settings

Zone 1

Zone 2

Zone 3

Zone 4

Zone 5

Zone 6

Zone 7

Zone 8

Zone 9

Zone 10

Zone 11

Zone 12

Save

Cancel

Zone Groups

Group ID	Grouped Zones	Configured Settings	Options
1	2,3		
2	4,5		
3	6,8		
4	10,11		

Add Group

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ETHERNET / RS232 PROTOCOL

The RS232 serial port provides data acquisition and control of the Mirage amplifiers by a home automation system, or PC. The interconnecting cable must be "Straight Through". For Ethernet, TCP port 17037 is used.

Baud Rate = 9600, Characters are all ASCII.

Command Structure: <command> <zone> <data> <line feed>

Command

Command	Description
01	Standby
02	Mute
03	Source Selection
04	Volume
05	Bass
06	Treble
07	Balance
09	Send All parameters
0B	Cause key press on Keypad
0C	Amplifier features
0D	Maximum Volume Limit
11	Volume Up
12	Volume Down
14	Request Device information
1C	Zone Name
1D	Preamplifier Volume Mode
26	Volume BCD format

Zone

Amplifiers are encoded with up to 96 zones.

The zone byte is used for checking if the command is applicable to the device receiving the command and if so, for optionally selecting a "sub-device", e.g. a bank or part of a device. All Zones are addressed using FF.

The lower 5 bits of the zone byte represent the zone 0 – 31

selection, i.e:

- » 00000 bin = 00 (hex) = zone 0
- » 00001 bin = 01 (hex) = zone 1
- » 01010 bin = 0A (hex) = zone 10
- » 11111 bin = 1F (hex) = zone 31

Examples:

Addressing a zone 10 amplifier: Binary 000-01010 or 0A hex

Addressing all Zone amp & preamplifier: FF hex

Send ASCII "0A"

Send ASCII "FF"

Data

Command	Content	
Standby (01)	00 – Standby OFF 01 – Standby ON 04 – Toggle	
Mute (02)	00 – Mute 01 – Un-mute 02 – Toggle Mute	
Source Selection (03)	00 – S5 01 – S6 02 – S7 03 – S4 04 – S8 05 – S1	06 – S2 07 – S3
Volume (04)	00 – A0 range	
Bass (05)	F4 – 0C (-12db - +12db)	
Treble (06)	F4 – 0C (-12db - +12db)	
Balance (07)	EC – 14 (Left –20db – Right –20db)	
Send all parameters (09)	XX – value ignored	
Amplifier features (0C)	00 – Loudness Enabled 01 – Loudness Disabled	
Maximum Volume Limit (0D)	00 – A0 Range	
Volume Up (11)	XX – Value Ignored	
Volume Down (12)	XX – Value Ignored	
Zone Name (1C)	Data field contains the ASCII string.	
Preamplifier Volume Mode (1D)	00 – A0 Range FF = Independent Mode	

Notes

- » Commands are used as notifications. If an amplifier is switched ON, it will notify the other devices on the Control Bus by sending the Standby command (01). Any amplifiers with the same zone will take the notification as a command and also switch ON.
- » When a command is sent to an amplifier it will first be transmitted on the control bus and then returned to the PC (Home Automation System). If an error occurs an error will be returned instead of the original command. The PC (Home Automation System) needs to ignore its command when it is returned.
- » A Standby ON command implies that the amplifier is not muted, if the amplifier was previously Off, a mute command must follow the Standby command if it is muted.
- » Not all Command and Data commands are covered in this document.
- » The expected reply for the "Send all Parameters" command (09) is >144 bytes. All command fields listed in this document are contained in the reply. The reply also contains advanced commands not listed in this document. The home Automation or PC's buffer should be large enough to receive and process the 144-byte reply.

1. Zone 2 links to Zone 3
2. Since Zone 2 is no longer linked to Zone 1, Zone 1 will no longer be linked to Zone 2.
3. Since Zone 3 is no longer linked to zone 4, Zone 4 will no longer be linked to Zone 3.

Example strings:

- » 010A01: Standby ON command for Zone 10 amplifier.
- » 012A01: Standby ON command for Zone 10 preamplifier.
- » 060002: +2db Treble setting on Zone 0.
- » 031F02: Select Source 7 on Zone 31.

SPECIFICATIONS

Amplifier Section

Rated Output Power (FTC)	
All Channels	50 Watts / channel, 8 Ω loads,
THD (Total Harmonic Distortion)	0.1% (40 Watt, 8 Ω load)
Speaker Impedance (Z1 – Z6 L/R)	4 Ω - 8 Ω
Input Sensitivity and Impedance	
(S1 – S6 L/R)	0.72 V / 22K Ω (Unbalanced)
Coax digital input level and Impedance	0.5V \pm 0.05V / 75 Ω
Frequency Response	20Hz – 20 KHz / – 3dB (8 Ω)
Tone Control	\pm 12dB, 100 Hz (Bass) \pm 12dB, 10 KHz (Treble)
Signal to Noise Ratio	100dB (IHA-A, 1V input / unbalanced)

Interface

IR Output	Eight 3.5mm Jack: IR1 – IR6 and Sum IR1 - IR6 Current limited to 25mA.
Expansion Bus	One Dual RJ45 Socket: Control I/O, Summed IR.
Ethernet	One Shielded RJ45 socket – 100Base T
RS232	One Isolated DB9 – 9600 Baud
USB	One USB mini-B 5 pin
Controller	Four RJ45 Socket: Port 1 to Port 4
Amp On & PG Control	One: 4 way terminal blocks (0V, IR, 12V & Data). One: 8 way terminal plug with Amp ON 1 – 4 contact closure inputs: PG1 & PG2.

General

Power Supply	110 – 240VAC 50/60 HZ
Power Consumption	320 W
Standby Power Consumption	4W
Dimensions	435 90 390 mm
Height including feet	105mm
Weight	7Kg

Specifications and features are subject to change without notice.

AUTONOMIC

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